A study of the Gas and Dust in Selected Comets FINAL REPORT April 1992 NASA Grant No. NAGW-2296

Dr. Humberto Campins
Principal Investigator

Department of Astronomy

University of Florida

Gainesville, Florida 32611

Summary

This research has been very successful and has yielded significant new results discussed in five publications in refereed journals. Among the most significant results discussed in these publications are:

1.The first simultaneous observations of the CN (0–0) violet and near-infrared bands in a comet (Tegler et al., 1992). These observations have constrained the fluorescence models and molecular parameters necessary to interpret CN observations in comets and in other astrophysical environments such as stellar atmospheres and the interstellar medium.

2.The identification of crystalline olivine in cometary silicate. The presence of crystalline olivine in a comet imposes significant constraints on the origin and thermal history of its nucleus. Spatial and temporal variability in the silicate emission from Comet Halley has been observed and is attributed to activity changes at the nucleus (Ryan and Campins 1991).

List of Publications from Research Sponsored by this NASA/Planetary Astronomy Grant

Principal Investigator

1. Comet Halley: Spatial and Temporal Variability of the Silicate Emission Feature (1991) E. V. Ryan and H. Campins, *Astron. J.* **101**, 695-705.
2. An Albedo Map of Comet Brorsen-Metcalf (1991) (S. E. Ridgway, D. Jewitt, H. Campins, J. Luu, M. Joy, C. Sisk and C. M. Telesco). In "Astrophysics with Infrared Arrays" ed. R. Elston Astron. Soc. Pacific Conf-Series, Volume 14, pp. 329-332.

S. Tegler

Dr. Stephen C. Tegler was a postdoctoral researcher working with Dr. Campins. For 12 months Dr. Tegler was partially supported by this NASA/Planetary Astronomy grant. During this period he published three papers and had one more accepted for publication; these are listed below:

Papers

1. Nitrogen Abundance in Comet Halley (1991) (S. Wyckoff, S. C. Tegler, and L. Engle). *Astrophys. J.* **367**, 259.
2. NH_3 in Four Comets (1991) (S. Wyckoff, S. C. Tegler, and L. Engel). *Astrophys. J.* **368**, 427.
3. NH_3 and NH_2 in the Coma of Comet Brorsen-Metcalf (1991) (S. C. Tegler, L. F. Burke, S. Wyckoff, M. Womack, U. Fink, and M. DiSanti). *Astrophys. J.*,**384**, 292.
4. Simultaneous Optical and Near Infrared Spectrophotometry of Comet Austin (1991) (S. C. Tegler, H. Campins, D. Kelly, S. Larson, and M. Rieke). *Astrophys. J.* in press, 1992

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